Office of Energy Efficiency and Renewable Energy

Commercialization of Nickel-Metal-Hydride Batteries for Electric and Hybrid Vehicles

Background

The development of batteries that can provide performance comparable to conventional vehicles and at comparable cost is key to making electric vehicles (EVs) practical. Today's lead-acid batteries must be recharged after traveling relatively short distances, limiting the driving range of EVs. Under a cooperative agreement with the U.S. Department of Energy, the United States Advanced Battery Consortium (USABC) has developed nickel-metal-hydride (NiMH) battery technology that expands the driving range of EVs.

Accomplishments

- Replacing lead-acid batteries with NiMH batteries in the DaimlerChrysler EPIC minivan reduced vehicle weight by 150 pounds and increased the driving range by 100%.
- General Motors Corporation (GM) doubled the driving range of the EV-1 car and S-10 pickup truck by incorporating NiMH battery technology in 1999 model year vehicles.
- Two commercial NiMH battery manufacturers have been established: GM Ovonic and SAFT America.

Benefits

- Advances in the specific energy of the NiMH battery have increased the driving range of EVs.
- Weight for weight and volume for volume, NiMH batteries demonstrate storage capabilities twice that of existing lead-acid batteries.
- Battery-powered EVs reduce the amount of primary energy used; very little petroleum is consumed.
- Electric vehicles are the only automotive technology that currently meets the California standard for zero-emission vehicles.

Nickel-Metal-Hydride Battery from GM Ovonic

Future Activities

- To reduce costs, USABC is concentrating on three key activities: raw materials, battery design, and volume manufacturing.
- DOE supports the introduction of EVs in the federal fleet and expanding the use of EVs to assist other fleets in meeting regulatory mandates.
- Phase III of the USABC Cooperative Agreement focuses on the next generation of advanced battery technology with the development of lithium-based batteries.

Partners in Success

USABC (DaimlerChrysler Corporation, Ford Motor Company, and General Motors Corporation)
GM Ovonic (General Motors Corporation and Ovonic Battery Company)
Ovonic Battery Company (a subsidiary of Energy Conversion Devices, Inc.)
SAFT America

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